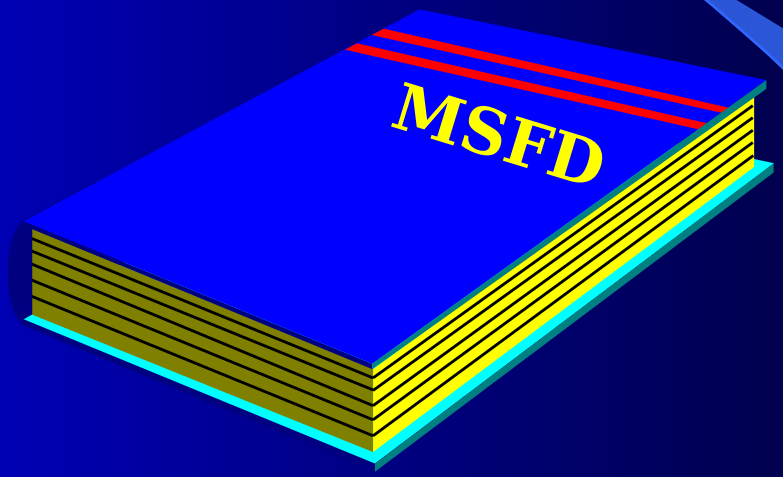
Main Space Fire Doctrin



and the Damage Control Assis

General Guidance

- A Plan of Action that provides the Guidelines to contain and extinguish a Main Space Fire
- Each ship shall develop a Main Space Fire Doctrine (MSFD) IAW Section 10, NSTM 555
- Guidance for Gas Turbine and Diesel Engine enclosures, including Class specific information for MSO, MCM and MHC is found in Section 8, NSTM 555.

General Guidance

- Type Commander Joint Instruction designed to assist ships in developing own Doctrine: COMNAVSURFLANTINST 3541.1C CH-1 / COMNAVSURFPACINST 3541.4B
- Doctrine inserted in Chapter 4 of *Repair Party Manual*

Preparation/Administration

- Procedures for: Underway Auxiliary Cold Iron
- Isolation Checklist: Fire Boundaries Smoke Boundaries Ventilation MechanicalElectrical

Main Space Fire Prevention

- Properly stow and protect all combustibles
- Test and inspect flammable liquid systems after repair - QA!
- EDUCATE all personnel in the reduction of fire hazards and maintain an *effective* Training Program

Main Space Fire Prevention

- ENFORCE fire prevention policies and practices: (1) Flange Shields (2) Lagging (3) Strainer Shields (4) Sounding Tube Caps (5) Flammable Liquid Leaks (6) Ventilation (7) Uptakes (8) EOP

Standard Assumptions During Training

- Effective mechanical / electrical isolation achieved
- Fire contained within a single machinery space
- Remote controls / shut downs available / working
- Communications established and effective
- Firemain system intact with adequate water supply
- DC supplies are adequate
- DC deck is tenable and DCRS are manned
- Personnel are trained and know their ship

Fires Rarely Follow the Standard Scenario

- Local and remote fuel shut down controls not accessible
- Access hatches remained open and/or were not approachable
- DC Deck not tenable, Repair 5 evacuated
- Normal communications lost

***ship's training program should include m
hallenging scenarios when basic drills ar
mastered!***

Summary of Action: Flammable Liquid Leak / Watchstander

- Report leak
- Deflect leak away from heat sources
- Isolate Source of leak
- Secure equipment near leak
- Use AFFF bilge sprinkling (1 MIN)
- Set Negative Ventilation
- Shoulder EEBDs

!! WARNING !!

NSTM 555 Vol 1 contains warnings regarding H_2S release during hose reel and bilge sprinkle use: ***If rotten egg odor is detected personnel NOT wearing breathing apparatus SHOULD evacuate the s***

Summary of Action: Flammable Liquid Leak / EOOW

- Report leak to OOD & request GQ
- Direct action IAW EOCC
- Order AFFF station manned
- Order additional equipment started to maintain firemain, electrical power, & propulsion

Summary of Action: Flammable Liquid Leak / OOD Underway

- Sound General Quarters
- Maneuver ship to limit smoke accumulation in case of fire and minimize rolling
- Ship Command and Control
- Keep CO and other ships informed on status of leak and plant status

Summary of Action: Flammable Liquid Leak / CDO Inport

- Sound General Quarters?
- Proceed to a central location (Quarterdeck / CCS / DC Central)
- Consider off-ship assets (R&A and Fire Dept.)
- Be familiar with DCA's MSFD checklist (will be completed by EDO)

Summary of Action: Flammable Liquid Leak

An oil spray fire resulting from the ignition of atomized flammable liquids ***SHOULD NOT be attacked! Life threatening conditions created by extreme heat, smoke and toxic gases can occur, especially on the upper level, **in a few seconds**.***

Summary of Action: Class B Fire / Watchstander

- Report “B” fire to EOOW
- Fight fire as directed by Space Supervisor using PKP, AFFF hose reel, & bilge sprinkling
- Secure machinery in affected space IAW EOCC

Summary of Action: Class B Fire EOOW

- Report B fire to OOD and request GQ
- Start equipment to maintain firemain, electrical power, and propulsion
- Order Bilge sprinkling activated until bilge fire is out
- Order fire and smoke boundaries set in surrounding spaces

Summary of Action: Class B Fire EOOW

- Set Positive ventilation in surrounding spaces
- Order affected space machinery secured
- Order mechanical & electrical isolation
  - EXCEPT:
    - Lighting
    - Ventilation
    - Firefighting equipment

Summary of Action: Class B Fire EOOW

- Establish comms with Repair Locker and DC Central
- Update OOD on plant status and limitations

Summary of Action: Class B Fire / OOD

- *No Changes*

Summary of Action: Class B Fire / CDO Inport

- Proceed to Quarterdeck / DC Central and establish comms
- Request assistance from Fire Dept. / R&A
- DCA’s MSFD checklist - receive reports from Duty Engineer
- Direct other personnel to the locker as necessary

Summary of Action: Class B Fire

- Fire is considered OUT OF CONTROL when:
  - Occupies a Large Area
  - Fuel source is NOT securable
  - Fire threatens fire fighter's escape route
  - Large amounts of smoke hinder visibility
- Time permitting, secure propulsion plant, don SEED/EEBD and evacuate

Summary of Action: Class B Fire Out of Control / Watchstander

- Activate Halon and AFFF bilge sprinkling
- Evacuate space (SEED / EEBD)
- Isolate space and contain fire and smoke

Summary of Action: Class B Fire Out of Control

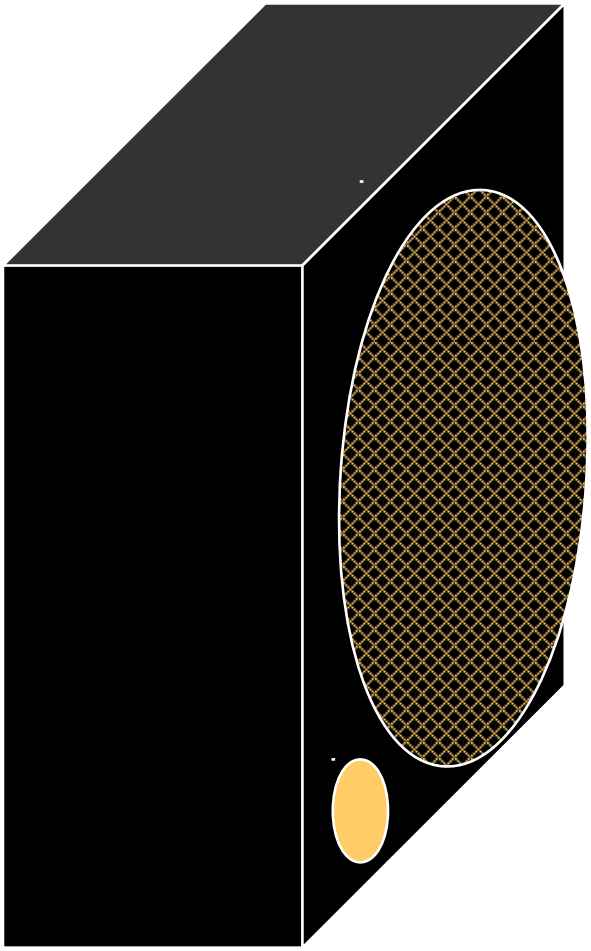
- Fire Boundaries - concentrate on vertical fire spread
- Smoke boundaries (Fume tight boundary)
- Space watchstanders report to designated muster point / senior individual make report of conditions to Repair 5 RPL

Summary of Action: Class B Fire Out of Control / R5 RPL

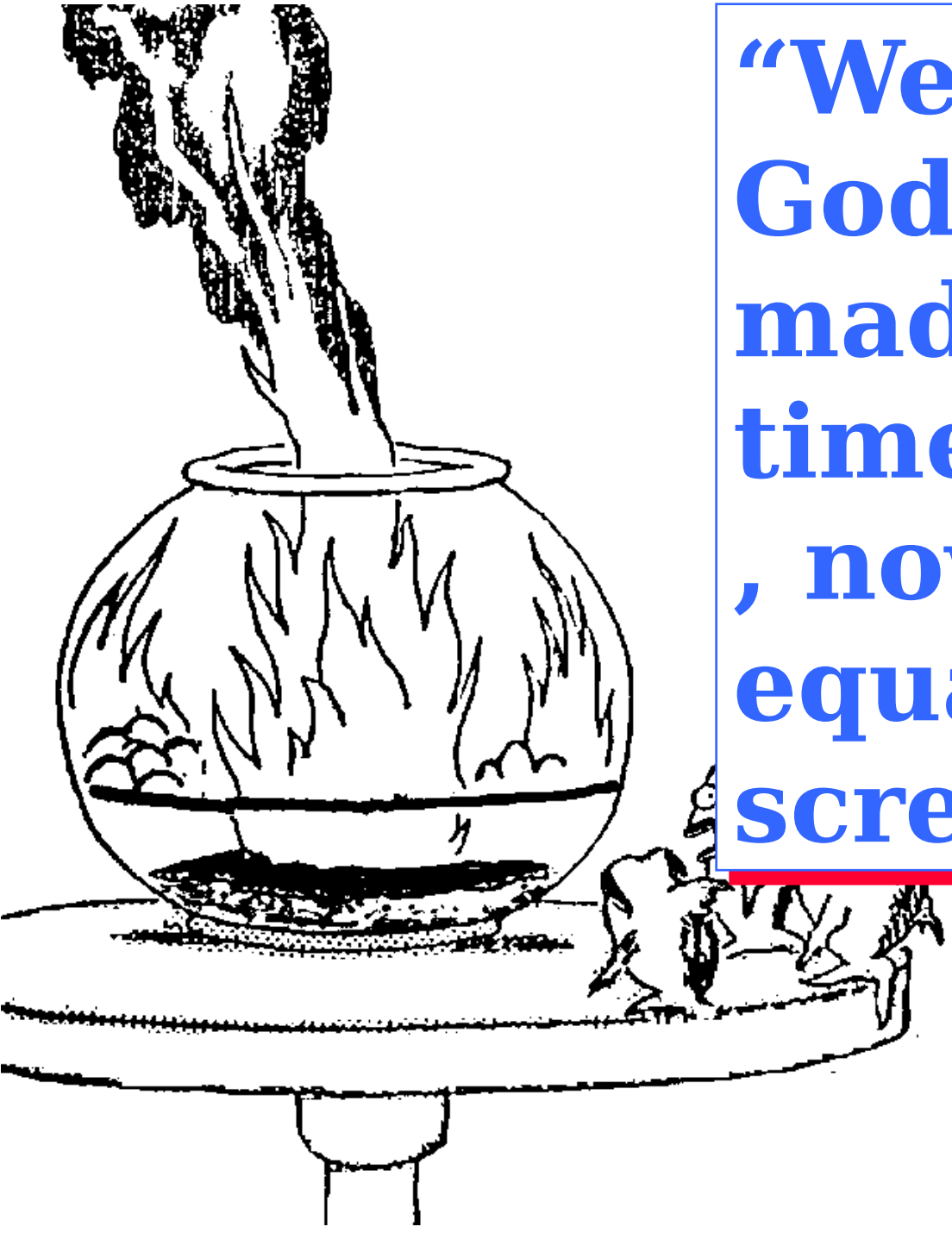
- Following space evacuation, order bilge sprinkling secured after 1-4 minutes
- Muster evacuees & receive report / pass information received to OSL, DCA
- Verify space evacuation and mechanically isolate firefighting equipment

Summary of Action: Class B Fire DCA / EOOW Turnover

- Plant Status
- Status of Mechanical / Electrical Isolation
- Status and location of leak
- Status and location of fire
- AFFF Bilge sprinkling and Halon activation times
- Status of space evacuation and casualties remaining in fire affected space
- Recommended re-entry route



This is the DCA! I have assumed control of firefighting efforts!



“Well, thank God we all made it out in time. …’Course, now we’re equally screwed.”

Summary of Action: Space Re-entry

- *Minimum* of 2 AFFF hoses with vari-nozzles charged and manned
- Halon Good (effective)? - Wait at least 15 Minutes
- Halon Bad (ineffective)? - Enter space as soon as possible following completion of mechanical isolation - SECOND shot of Halon?
- Buffer Zone, Active Desmoking?

Summary of Action: Space Re-entry

- Prior to re-entry, activate AFFF bilge sprinkling for ***2*** additional minutes
- Select re-entry access which is not obstructed by fire
- Mech Isolation ***must be*** complete, Elec Isolation may be in progress
- Extinguish fire, Report fire out, Post reflash watch

Vertical Trunk Entry

- Advantages
  - Protection from fire, heat, smoke and combustible gases as they spread upward
  - Eliminates the spread of heat, smoke and combustible gases onto the DC Deck

Vertical Trunk Entry

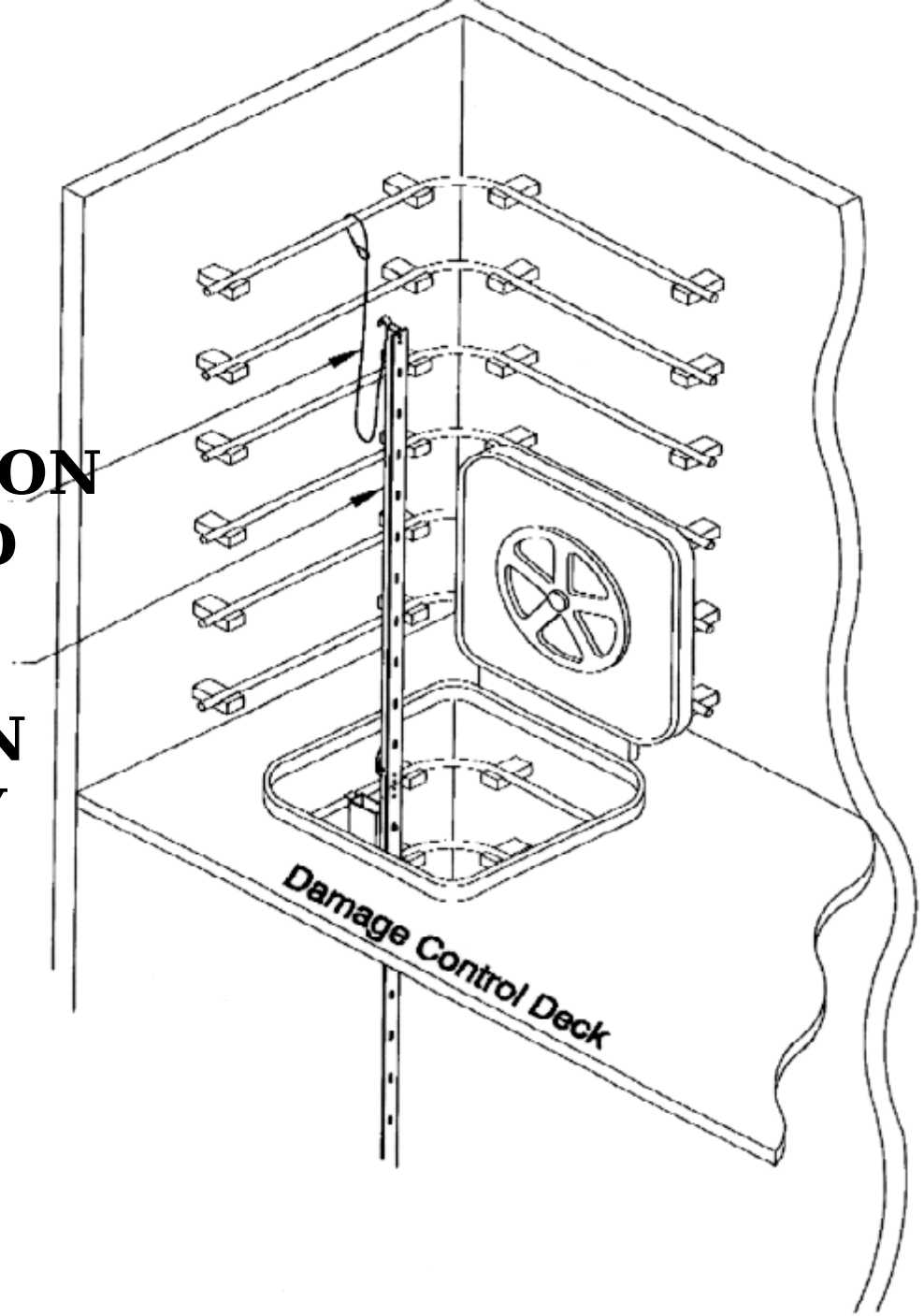
- Advantages
  - Allows entry and attack from a more tenable location - descent through thermal layer no longer required
  - Reduced possibility of Backdraft explosion
  - Limit spread of smoke

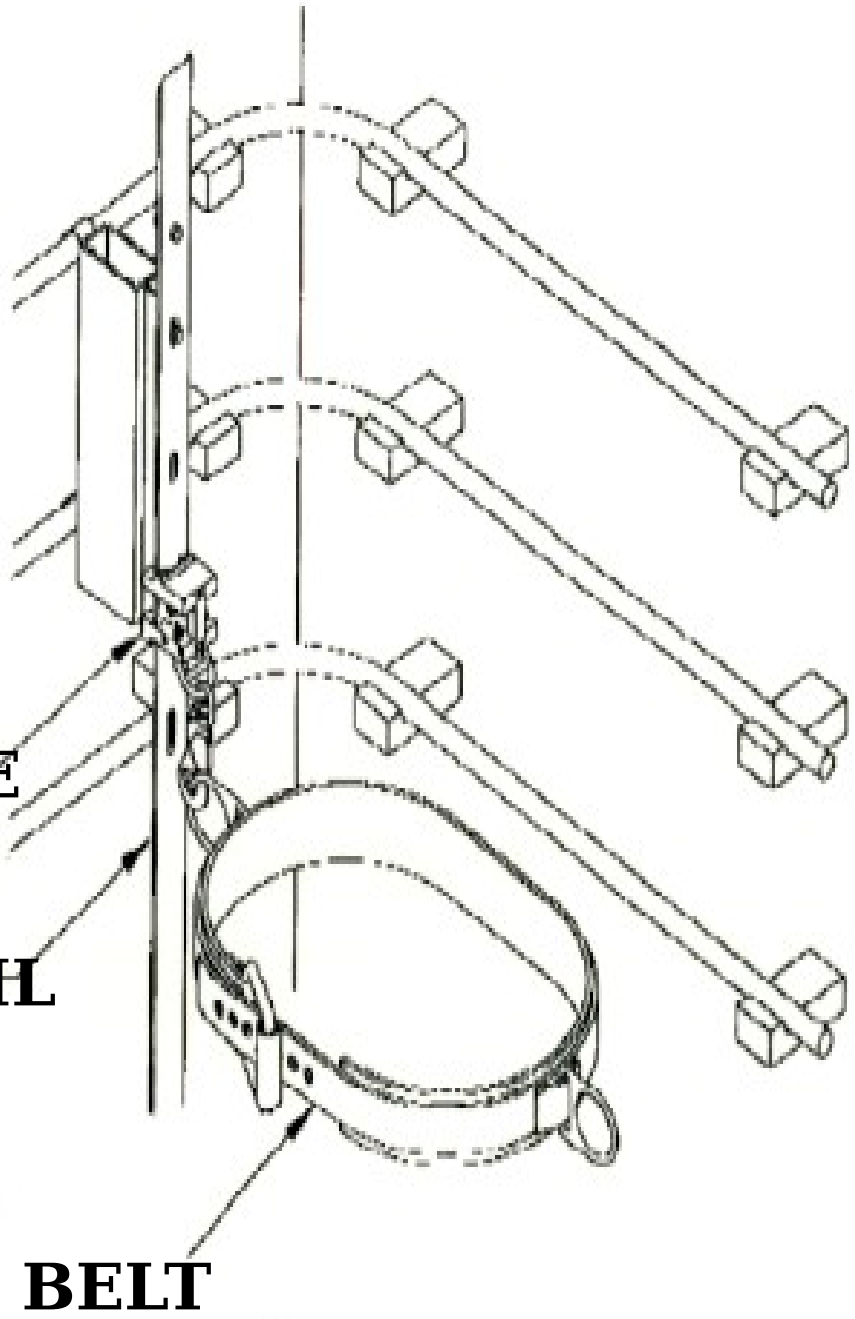
Vertical Trunk Entry

- Disadvantages
  - Firefighters unable to use their hands when exiting space due to burns
  - Risk of falling
  - Risk of fire and smoke entering trunk
  - Difficulties involved with extracting incapacitated personnel from escape trunk

EXTENSION LANYARD

RAIL EXTENSION ASSEMBLY




CARRIER SLEEVE
CARRIER RAIL
WAIST BELT

EMERGENCY ESCAPE

Post Fire Space Overhaul

- Final Extinguishment
- Desmoke Space
  - Installed Ventilation may be used with minimal risk if: Fire extinguished / overhauled Fuel source secured Space allowed to cool Electrical system not damaged AFFF Bilge sprinkling operated All fuel flushed into bilges

Post Fire Space Overhaul

- Desmoke Space
  - Installed Ventilation:
    - Circuit breakers and other protective devices found tripped shall be left until extent of damage can be assessed
    - Operate on fast for 15 minutes
  - Portable Blowers (in conjunction w/ Active desmoking)
  - Positive pressure from adjacent spaces

Post Fire Space Overhaul

- Test Atmosphere
  - Refer to NSTM 074 Vol. 3
  - Oxygen, Explosives
  - Toxics
    - Hydrocarbons
    - Carbon Dioxide
    - Carbon Monoxide
    - Hydrogen Chloride
    - Hydrogen Cyanide
    - Hydrogen Fluoride (when Halon Used)

Post Fire Space Overhaul

- Dewater
  - Refer to NSTM 079 Vol. 2
  - May be required simultaneously with firefighting
- Reman Space

Review Question

- During the Flammable Liquid Leak/Main Space Fire scenario AFFF bilge sprinklers are operated at what points?
- Initial discovery of the leak: 1 minute
- When the fire breaks out/is discovered: 1 minute
- Upon space evacuation: 1 to 4 minutes
- Prior to space re-entry: 2 minutes

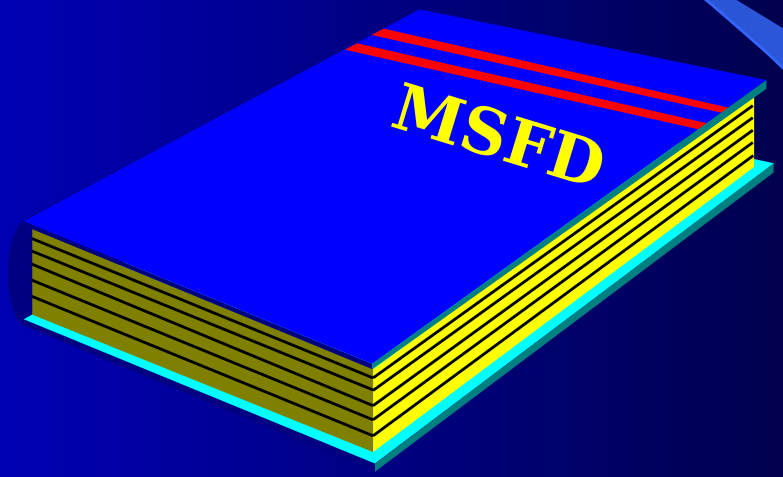
Review Question

- How should the ventilation be configured in the affected engineering space during a Class “B” fire?
- Ventilation in the affected space should be NEGATIVE (Unaffected spaces surrounding the affected space will be POSITIVE)

Review Question

- What information should be turned over to the Repair 5 Locker Leader from the senior watchstander evacuating the engineering space?
- Equipment secured/operating
- Location/size of the flammable liquid leak
- Location/size of the fire
- Was leak isolated?
- Status of personnel
- Status of Halon/AFFF bilge sprinkling
- Recommended re-entry route

Main Space Fire Doctrin



and the Damage Control Assist

UNIT 5.13